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(54) Procedure and Device for Input of Process Parameters

(57) This invention describes a procedure and a device for input of process parameters, specifically a heating/air conditioning system or components related thereto, whereby on an input device (1) of a control unit (2) of a heating/air conditioning system or, for example, a room-temperature control unit, different process states and/or the parameters (14,16) to be adjusted accordingly by means of variable indicator/control fields (7,...7f) and, if applicable, in conjunction with fixed indicator/control fields (10, 12), are displayed. By selecting different control levels (23a, ...23e) the respective process parameters (14, 16) can be entered for each selected control level, causing different indicator/control fields to appear. The design of these indicator/control levels (7,...7f) is variable, i.e., they function either as an indicator or control field for each control level, or assume no specific task, each time varying in their function, their significance, and their dimensions. Thus, the operator is guided, according to each control level (23a, ...23e), by indicator/control areas of different design, emerging in different positions of the input device (1) in different dimensions and with different functions; thereby, intuitive user guidance is guaranteed.

FIG. 1

Description

[0001] This invention pertains to a procedure for the input of process parameters, specifically of a heating and/or air conditioning system, as claimed in claim 1, an input device of a control unit for the input of process parameters and use of this procedure and the input device for programming a heating/air conditioning control unit, a thermostat, or an air conditioning control unit as claimed in any of claims 14 thru 16.

[0002] Such procedures and devices for different purposes and applications are already known. For example, **EP 0 831 276 A1** lists a known input device for the control of kitchen stoves, displaying a so-called "touch-screen" , which displays different indicator/control areas of different operating modes of a stove in connection with fixed indicator/control fields; these areas also serve as controls for individual burners on top of stove ranges.

[0003] In addition, computers placed in airports and banks are known to be equipped with such touch-sensitive input areas, for the purpose of facilitating the operator's data input by enabling him to avoid using a keyboard or mouse. Such touch-sensitive input-masks are known from **WO 93 11 518 A1** and consist of two transparent flexible plastic sheets/films equipped with almost invisible electrodes in-between, on touch creating an electric contact, thereby communicating the touch position, i.e., the operator's "request", to the control unit and control device, enabling it to compare the touch position with the respective underlying function, thereby performing the requested task.

[0004] By contrast, control systems in buildings are far more complex. Even in a simple private home, a heating system consists of a different number of components, e.g., a burner, a pump, different valves, thermostats for the different rooms, and, as a possible addition, an air conditioning system, all of which must be regulated and controlled and perform different functions, depending on the heating program. This requires, for example, for the heating system to provide different temperatures at different times of the day or for different days of the week or during vacation days.

[0005] Present-day "intelligent" building control systems include control of furnace, air conditioning, security systems, fire detection equipment and additional systems to maintain a building, adding more and more to an increased complexity in this sector as well. In order to reliably regulate and control such systems, the current owner, in most cases, needs to study very complicated and voluminous operating manuals.

[0006] In addition, the problem of adjusting the respective control parameters and process parameters within a building control system consists in that in many cases the user only rarely changes the adjustment of the respective process parameter – perhaps in summer or winter – so that, unlike the operation of computers or kitchen appliances, he no longer remembers the operating instructions about the control device.

[0007] Traditional control devices for the adjustment of, say, heating/air conditioning systems of a building are mostly of a very complex design, because the different multitude of process parameters must be entered for a multitude of different process conditions. For the most part, programming errors occurring in these traditional heat-control units are not immediately detected, and during the course of days, weeks or even months of this error-state prevailing in the system may cause lasting defects to or even ruin individual appliances, heating units, or system facilities. In addition, strict guidelines issued by the Technical Inspection Agency [TÜV] and relevant licensing bureaus for approval and initial operation of such heat control units, require their "fail safe" design. In this instance, too, there exists a fundamental difference between these extremely complicated heat control units and the very easy operation of kitchen appliances, fax machines, copiers, or bank-transfer computers.

[0008] The above-mentioned factors – significant complexity of heating units, complicated instructions to be absorbed by operators, lengthy intervals between operations of these devices and the inherent potential of severe or even ruinous consequences to a building, caused by a maloperation of these heating control units – for some time have led to a demand for an easily operated and intuitive user system for the input of process parameters relating to heat control units.

[0009] **EP 0332 957** informs us about a heat control unit with an, inter alia, multifunctional display provided with set as well as variable input fields. Applicable keyboards are strictly allocated to definite operating modes,

with this heat control unit showing one line of variable keyboards, which, according to the selected operating level, are suitable for controlling different process parameters. To these keys – arranged in a set location of the input field -- can be selectively allocated different functions in menu form. The disadvantage of this heat control unit lies in the complexity of inputting the appropriate process parameters as well, demanding of operators a high degree of knowledge about programming these heat control devices, as on one hand these keyboards are always positioned in a fixed location, on the other hand their dimensions are unchangeable, forcing operators to advance to different operating levels by frequent and repeated pressing down on different keys. However, these operating levels are of a very complicated design and, because of the keys being almost constantly occupied, understanding their application remains limited. The variable keys are also programmed with constantly recurrent references, their dimensions remaining unchanged.

[0010] Therefore, the underlying task of this invention is to improve input procedures and devices of heating/air conditioning systems of the type mentioned in the beginning, so as to avoid the disadvantages of conventional procedures and devices and, specifically, to make it possible for operators to intuitively program the control unit of a heating/air conditioning system or any of its components, without prior knowledge and without having to study lengthy and complicated operating instructions.

[0011] The task of this invention will be solved by means of independent claims 1 and 7. Further developments are claimed in each sub-claim: Several applications of the procedure according to the invention and the input device according to the invention are claimed in claims 14-16.

[0012] This invention describes a procedure for the input of process parameters, specifically a heating/air conditioning system or components connected thereto, where different process conditions and/or the corresponding process parameters to be adjusted are shown on an input device of a control unit of the heating/air conditioning system or, as an example, of a control unit regulating the room temperature of a certain room or air conditioning several rooms of a building, by means of variable display/operating areas and, if applicable, in connection with set display/operation areas. By selecting different control levels, each process parameter can be entered, causing various display/operation areas to appear. These display/operation areas are designed to be variable in such a way that they either function as a display or an operating area for each control level or perceive no specific task but time vary in their functions, their reference, and their dimension, where according to the operati0n level, the operator is guided by differently designed display/operation areas emerging at different positions of the input device in varying dimensions and with varying functions.

[0013] By means of simple, intuitively self-explanatory symbols the user moves "hand over hand" through the operational levels by pressing menu-reatede on the corresponding operating panels which by the display of different operational fields at different positions and with different dimensions guide the user step-by step through the programming process of the heat control unit.

[0014] Selection of different operation levels can proceed in different ways: One, it is possible to select the different operational levels by means of certain display/operation areas. As soon as a certain operational panel is activated, parts or the entire input area will change; new operation/display areas of different dimensions and functions will appear, thereby pointing out to the operator in a simple way which process parameters he about to adjus and which process condition an/or process parameter happens to apply at the moment.

[0015] Another possibility would be to equip the input field of the input device with different insert cards, so that according to the inserted card the respective operating areas of the input field would display different functions, meanings, and dimensions. The insert cards then define the different operating levels, the functions of the input device, and the image and selection of at least parts of the display/operation areas. The insert cards may be designed as magnetic, mechanical, electronic, or optical data carriers in the format of a credit or telephone card, having either a magnetic strip, an electronic chip or a perforated area in order to communicate to the input device which function is supposed to be set or which function the input device is to perform. The input device is capable of communicating with the corresponding insert card.

[0016] By means of these insert cards, which on the input device correspond partly or completely with the respective LED, LCD, or set indicators, visually replacing, supplementing, functionally adjusting, optimizing and/or parameterizing them, the service specialist or user of the system to be adjusted is able to quickly and cost-effectively program and adjust the input device. The system-specific parameter are transferred in situ by inserting the card and provided with a systems diagram and key allocation. Buy inserting the card,

the device is then parameterized, controlled, and optimized. This combination of insert card, variable display/operation fields, and their automatic allocation substantially reduces time spent by service personnel in situ, as well as maintenance, installation and reprogramming costs.

[0017] Another possibility consists in letting the input field connected – detachably --with the input device, slide across a surface, which clearly shows all procedural conditions and process parameters of the procedure to be controlled, in order to adjust the respective process parameter. The different positions of the input represent the different levels of operation which, in the case of insert cards or activation of different operation levels by individual operation areas represent individual levels of operation by means of display/operation areas.

[0018] In this process, the variable display/ operation areas will relect only the part of the process that is selected by the respective control level and is needed at the moment for the adjustment of the corresponding process parameter, thereby avoiding an inundation of operators with excessive and confusing information.

[0019] As an advantage, the process parameters relevant in each case are changed during the input of process parameters by corresponding indicator/operating fields, so as to allow the operator to maintain control over his current activity at all times. Thus, at input of the respective values, the dynamic change of the relevant process parameters facilitates "the programming of the control unit in a playful way". This offers a variety of graphic possibilities to facilitate the input of different process parameters for operator. Furthermore, this provides the possibility of programming different controllers by the same input device, i.e., the possibility of using a portable input device that will be attached to the respective controller that then can be programmed via the above-mentioned control levels. This will drastically reduce the cost of input devices for controllers of heating/air conditioning systems or their related components. Furthermore, adjustment of the many different components of the heating/air conditioning system will be made easier for the user by the fact that he always deals with the same menu management and the same symbols and images of process parameters, making it possible for him to use the same input device to perform a great variety of programming functions, regardless of room temperature adjustments, adjustment of the central heating kettle, or adjustment of air conditioning for different rooms.

[0020] The input area is a touch-sensitive and transparent field, realizing the vastly different operational fields in known ways by means of a transparent and/or semi-permeable touch-screen element. These transparent elements are familiar and available on the market in large quantities. Therefore attaching the detachable input field to the input device and to provide for appropriate means of communication so as to be detachable appears to be advantageous, in order to make communication between input field and input device possible. This communication may proceed either wire-bound, radio-controlled, or by optic means, thereby, for example, enabling operators to program different controllers inside a house by means of a portable input area.

[0021] For instance, placing certain surfaces, backed by symbols, on or adjacent to respective controllers, so that the input area merely has to be placed on top of the surface for appropriate programming, would be an option. The appropriate position of the input area on the surface would then be determined mechanically or electromagnetically or optically. Similar to the computer "mice", the input area can be moved across the surface, where, depending upon the position on the surface different functions, dimensions, or meanings are allocated to individual indicator-/operation areas. Another possibility would be to combine this input area with an LED-indicator that can be co-integrated into the input area and, furthermore, could be of transparent design as well, so that, according to the selected function, and/or according to the process parameters to be adjusted, the relevant process parameters is shown on the input area itself, next to the subjacent surface, changing dynamically upon input of the appropriate data.

[0022] Furthermore, the input device may itself have an opening to receive insert cards that define the different operation levels and are provided with a perforated grid, to enable the input device to identify the type of insert card used. As an option, the insert card may be provided with a magnetic strip, indicating to the input device which card is inserted at the moment, whereupon the input device communicates to the input area which indicator/operation areas are activated, their function and meaning, the dimensions to be shown and, if applicable, the LED-readings to be activated. These LED-readings can also be deposited with parts of the input area, so that the respective indicator/operation areas of the input area indicate no function at this point.

[0023] In this way, the greatly different dimensions of operation areas and/or display areas can be defined – either having a display or operation function or merely acting as non-functioning "glass" for the display of subjacent LED-readings, surface, symbols, or graphic images.

The combination of display/operation areas is designed in a way that, according to the selected operation level, individual areas either serve for displays or operations or for display plus operation or, in addition, to cover up or display subjacent surfaces. Furthermore, colored plastic of paper cards can be inserted between LCD/LED-reading and/or the display/operation surface and the touch-sensitive element, i.e., touch-screen input area, to cover parts of the subjacent display area, for the purpose of realizing specific input/display options. This allows to emphasize particular elements, e.g., time periods of temperature decreases and time periods of heating intervals, highlighted in part by color-coded cards and in part by the subjacent reading "display" or by lighting up, to communicate to the user that this particular area is currently either activated or deactivated. This is illustrated by:

Fig. 1 Schematic view of a heating/air conditioning system with input device, according to the invention, and enlarged view of the input area;

Fig. 2 input device and sectional view of the input device;

Fig. 2a a different design of the input device, according to Fig. 2;

Fig. 2b an additional design of the input device according to Fig. 2;

Fig. 3 an additional design of the input device, according to Fig. 2 and sectional view of input device;

Fig. 4 view of a first operation level of the input device;

Fig. 5 view of two second operation levels;

Fig. 6a view of a third operation level;

Fig. 6b view of a fourth operation level;

Fig. 6c view of a fifth operation level;

Fig. 7 view of an additional fifth operation level;

Fig. 8 view of a variation of the operation level, according to Fig. 7;

Fig. 9 view of a dynamic 5th operation level with an appertaining 6th operation level; and

Fig. 10 schematic view of a very large number of two-dimensional operation levels, arranged side by side.

[0025] Fig. 1 shows a schematic view of a controller 2, for example of a heating/air conditioning system with flow 3b, return 3a, and pump 4. Likewise, controller 2 may involve the thermostat of a warm-water pipe 3a and 3b, connected with one or several heating units (not shown) via a stop valve 4 which is connected with room-temperature sensors (not shown) which reads the current room temperature and provides it to controller 2, thereby enabling it to control the warm-water pipe of the heating unit in accordance with adjusted temperatures during different hours of the day.

[0026] The heat controller 2 is connected to an input device1 which a data line 5 (in case it is placed at a distance from controller 2) or which may be attached directly to the controller 2. The input device shows an input area 6, enlarged for emphasis in Fig. 1 emphasis. This input device 6 is equipped with display/operation areas 7, shown schematically in Fig.1 as an arrangement of cells and columns.

[0027] Fig. 2 shows a view of the input device 1 with input area 6 which is fastened on top of the input device1. Input area 6 shows a number of display/operation areas 7, arranged besides fastened display/operation areas 10. The right half of input area 6 is used to indicate e.g., room temperatures varying between 5° C and 30° C, the actual current temperature being indicated by one or more light-emitting diodes 8. The section through input device 1 also shows the display/operation areas 7 arranged at the left side and the etiquettes and adhesive labels10 fastened for temperature readings, arranged next to each diode 8. This section of input area 6 can also be transparent, in order to make the markings underneath the display area 6 visible. By example, current temperatures can also be realized by means of digital readouts. Underneath the variable display/operation areas 7, a hollow space is provided for receiving insert cards 9, which are provided with appropriate means fore the input device 1 to recognize the type of card that has been inserted into opening 11.
According to the type of card 9 inserted into the opening, the display/operation areas 7 are assigned different functions, meanings, and/or dimensions, so that either individual display/operation areas 7 have individual functions or a group of display/operation areas 7 are combined to perform one function or display.

[0028] Fig. 2a shows a different design of input device 1 according to Fig. 2, having input area 6 attached atop input device 1. Again, cards 9 are used to be inserted into opening 11; these insert cards 9 are smaller than those used in Fig. 2, so that the lower half of input area 6 is used as fixed display/operating area 7a. This display/operation area 7a can be provided either with different functions and/or references by the input device 1, by means of a subjacent active surface for the display of process parameters or be used

strictly for the display of process parameters which can be changed via variable display/operation areas 7 in the upper left part of input area 6. Here, too, the right half of input area 5 is used for temperature readouts, displayed by etiquettes or adhesive stickers 10, their active status being displayed by light-emitting diodes.

[0029] Fig. 2b shows a further design of input device 1, according to Fig. 2 or Fig. 2a, where, as an additional feature the right, previously static input area 6 has been replaced by two oblong variable display/operation areas 7f, which can be used e.g., for the display of relevant process parameters or for the input of additional functions. As an example, when inserting a card 9 into the upper left part of input area 6 one could conceivably provide the respective operation areas 7 with their respective functions, while a larger display area 7a at the left lower part of operation area 6 is activated to indicate the process status to be actually adjusted, whereas the small static display area at the right lower edge of the input area 6 can be intended as an warning area in a situation where the room temperature drops, say to 5° Celsius. If the temperature exceeds 5° C, both right oblong areas 7f of input area 6 can me used to read the current temperature and in addition be used to show date and hour.

[0030] Fig. 3 shows yet another design of input area 6 according to Fig. 2, Fig. 2a or Fig. 2b. In this version the right lower half of display area 6 is intended as fixed display/operation area 12, to be equipped either with switches, buttons, or keys, whereas the other parts of input field 6 are provided with variable display/operation areas 7.

[0031] By example, Fig. 4 shows a first operation level 23a of operation area 6, subdivided into two upper rows of six each variable display/operation areas 7b and to lower fixed display areas 7c. The upper left variable display/operation area 7b shows the current hour, where pressing down on the operation area changes the entire input area 6 and , e.g., a second operation level 23b according to Fig. 3 (at the left side) appears, containing only 4 areas. At the left side, display area 7a can be seen, showing the actual hour, in this case "09:45". By pressing down both upper right control keys (operation area) 7b, the time can be adjusted, while the lower-most right control key 13b is used to reset into the first operation level 23a, according to Fig. 4.

[0032] By pressing down on the upper central display/operation area 7b, according to Fig. 4, the second operation level 23b, depicted in Fig. 5, is reset, which, like the second operation level 23b can be used to adjust the time. The current day-temperature, in this example 23° C, is shown at the left side, while the current day-temperature (e.g., the room-temperature) can be adjusted by both upper right keys 13. By pressing down on the lower right operation area 7b, the return key 13b retrieves the screen, i.e., i.e. into the first operation level 23a, according to Fig. 4.

[0033] The same procedure applies to the upper right display/operation area 7b for adjustment of the respective night temperature. The adjustment of thermostats for the entire day is located below the upper threedisplay/operation areas 7b according to Fig.4. On the lower two rows of input area 6, one recognizes display areas 7c, which show the different hours as well as the date 21, i.e., always the current date. The rectangular curve shows the adjusted room temperatures at different times of day, and point 17 displays the current hour – also displayed in the upper left display area 7b.

[0034] Fig. 6a shows a third operation level 23c, accessible by clicking the return keys 13, according to Fig. 5, as long as this procedure is provided for. There, the days of the week are displayed by means of different large display/operation areas 7d. The display of current weekdays 14 is used for the adjustment of different heating graphs for each day of the week; a "copy" key activates the installed copy function. The "return" key 13b is used to "jump" back to the first operation level 23a. However, it is also possible to jump into operation level 23c, depicted in Fig. 6a by clicking the above-described keys of the first operation level 23a, so that clicking the respective days of the week results in jumping into the respective second operation level 23b, shown in Fig. 5, in order to input the desired temperatures for different times and different conditions of the day.

[0035] Fig. 6b shows a fourth operation level, characterized by the capability to intuitively adjust the rectangular curve shown in Fig. 4 by defining the different time periods t1 to t6. the upper two rows of display/operation areas 7e are used to adjust the time periods t1 to t6 as well as time as such, i.e., the adjusted current time for the respective time period – the time changing dynamically by clicking the arrow keys. In these areas, indication of the individual time periods t1 to t6 is static. Thereby the first two rows of display/control keys 7e meet the demands of display areas, of operation areas, and of set display/operation areas.

[0036] The lower two rows of display/operation areas 7e are used for dynamic display of the current, adjusted process parameters t1 to t6, as well as for a readout of the respective day- and night-temperatures, adjustable by the left lower four display/operation areas. Again, arrow keys13 are used to adjust the displayed temperature 14. When changed, i.e. the relevant arrow key 13 is clicked, the upper and/or potential of the heating graph 16a and 16b changes.

]0037] Fig. 6c shows another design of the fourth operation level 23b, defining different on- off stages for different times of different heating periods as well, using display/operation areas 7b, activated accordingly by touch, indicating to the operator by the light of an individual operation area l, that now the time within the operation field can be changed by clicking

arrow-key 13. Clicking the return key 13b resets the third operation level 23c.

[0038] Fig. 7 shows another design of input area 6, having a large display field 7a, which is changed via operation fields 7b and its arrow-symbols 13. On the left lower display area 15 the symbol for the relevant day-period is located, in this diagram, for example, the daily activity. By clicking both upper left arrow-keys the relevant daytime temperature (here, 24° C) can be enlarged or reduced, while with both lower right arrow-keys 13 the on/of time for this daytime temperature can be altered. During this process, a ball 17 moves slowly along the rectangular graph , so that, depending on the position of the ball, either both upper left control keys 7b or both lower right control keys are activated, enabling the operator to adjust the correct time as well as the correct temperature.

[0039] Fig. 8 shows another design of the fourth operation level 23d of Fig. 7, which, instead of a rectangular curve as in Fig. 7, is provided with a coordinate system, whose horizontal axis indicates the current temperature and the vertical axis – the correct time. By using the relevant arrow-keys, the currently adjusted variable16 can be altered so as to adjust the respective temperature for the corresponding time period or time to achieve the selected process status 15. Even this instance clearly shows that only a few of the variable display/operation keys are intended for operation, whereas other display/operation keys 7 are used for display or are meaningless.

[0040] Fig. 9 displays another adjustment option of the fourth operation level 23b, also including a fifth operation level 23a. Clicking the left lower two arrow-keys 13 of the fourth operation level 23d, allows point 17 to move dynamically along rectangular graph 16, while an indicator simultaneously shows the position of point 17 on the curve. The upper large display area 7a operates only for dynamic display of the of the changing process parameter that can be changed by means of the two lower arrow-keys. By clicking the relevant return-key 13b the actual daytime and nighttime temperature for the selected time 14 in the sixth operation level 23e, with the operation area 7a of the sixth operation level 23e automatically indicating the relevant night or day-symbol, depending on the time 14 the return-key 13b has been clicked in the fifth operation level 23d. By clicking the return-key 13b of the sixth operation level 23e, a jump back into the fifth operation level is possible. Inside the fifth operation level 23d another area (not shown) can be provided, guaranteeing a return jump into the first Operation level 23a, shown in Fig. 4.

[0041] Fig.10 shows an alternative design of this invention, having an input device connected by a line with a transparent input area 6.

[0042] This input area 6 can be moved across the surface 30 backed by symbols. The surface is provided with means for detecting the position of input area 6. In addition, input area 6 can itself be equipped with such means, in order to communicate e current position to input device 1. This can be realized by moving input area 6 into a reset position by clicking a certain key on input area 6, to communicate to input device 1 that input area 6 is currently placed on reset.

[0043] All relative moves of input area 6 can be detected by optic or mechanic means (e.g. small balls on the underside of the frame of input area 6). Depending on the adjusted position of input area 6 on surface 30, the applicable display/operation areas 7 of input area 6 are defined by appropriate functions, references and/or dimensions, so as to enable input device1 to assign different tasks to relevant display/operation areas 7, depending upon the position. The surface 30 is provided with symbols 7, 14, 13 of different type and size and can also be provided with a surface 12 for operator's information: it performs no technical function. Here, too, input area 6 can be provided with combined display/operation areas, which can cover parts of the surface below or overwrite them with other displays, therebypotentially achieving utmost flexibility.

[0044] This arrangement is of particular advantage, as operators have a clear view on surface 30 of each function and all process parameters and process states. Depending on their planned use, "controllers" or "process parameters to be adjusted", different adjustments of applicable display/operation areas can be defined.

Patent claims

1. Procedure for input of process parameters, specifically a heating/air conditioning system or related components,

by displaying on an input device 1 of a controller 2 different process conditions and/or the relevant process parameters (14, 16) by means of display/operation areas (7, ...7f) and possibly in conjunction with fixed display/operation areas, and to select different operation levels (23a,...23e) for input of process parameters (14, 16) via different display/operation areas (7, ...7f, 13), **characterized by**

the input of process parameters (14, 16) via variable display/operation changing their function, reference and/or size according to the selected operation level (23a,...23e), where the variable display/operation areas (7, ...7f) are located, at least in part, in varying positions.

2. Procedure as claimed in claim 1, **characterized by**

selection of the different operation levels (23a, ... 23e) by means of certain display/operation areas (20, 13b) and/or by means of insert cards (9), and/or by means of Input area 6 of input device 1 and underlying surfaces or parts of a surface (30).

3. Procedure as claimed in claim 1 or 2, **characterized by**

selection of process parameters (14, 16) via variable display/operation areas (7, ...7f) which reproduce only the part of the process selected by the applicable operation levels (23a.... 23e).

4. Procedure as claimed in one of the aforementioned claims, **characterized by**

providing the insert cards (9) with information for the selection of variable operation levels (23a, ...23e).

5. Procedure as claimed in one of the aforementioned claims, **characterized by**

the input of process parameters (14, 16) over variable display/Operation areas (7, ...f), which according to values entered, undergo a dynamic change and/or indicate a different operation level (23a... 23e)

6. Procedure as claimed in one of the aforementioned claims, **characterized by**

graphic representation of process parameters (14, 16) i.e., temperatures, weekdays, heating curves, heating periods or combination of process parameters (14, 16), this graphic representation undergoing at least partial changes during input of process parameters (14, 16)

7. Procedure as claimed in one of the aforementioned claims, **characterized by**

detecting variable operation levels (23a, ...23e) and allocating variable display/operation area (7, ...7f) to input area (6) or to parts of input area 6 of the input device (1), according to their function, reference and/or their size.

8. Input device (1) of a controller (2) for the input of process parameters, specifically a heating/air conditioning system or related components, with variable display/operation areas (7, ...7f) and, possibly, fixed display/operation areas (10, 12) indicating different process conditions and/or process parameters (14, 16) to be adjusted, and can be input into various operation levels (23a,...23e), via process parameters (14, 16), via varying display/operation areas (7, ...7f, 13),

characterized by
the input capability of process parameters (14, 16) via display/operation areas (7, ...7f) which, according to the selected operation level (23a, ...23e) alter their function, meaning and/or size, and the fact that the variable display/operation areas (7, ...7f) for varying operation levels (23a, ...23e) occupy varying position, at least in part.

9. Input Device (1) as claimed in claim 8, **characterized by**

input device (1) having a touch-sensitive and transparent input area (5) that has varying operation areas (7, ...7f), detect touch and relay it to the input device (1), as well as making visible any surfaces, data, or objects located below the input area (6).

10. Input device (1) claimed in claims 8 or 9, **characterized by**

the fact that the input area (6) is detachably connected to input device (1) and has means for data communication with input device (1

11. I nput Device (1) as claimed in one of claims 8 - 10 **characterized by**

input device (1) having an opening to receive insert cards (9), defining the different operation levels (23a...23e), as well as having means for the detection of the insert card (9) used in each case.

12. Input Device (1) as claimed in one of claims 8 – 11, **characterized by**
the defining by insert cards (9) of different operation levels a...23e), functions of the input device (1), and display & selection of at least

parts of display/operation area (7,...7f).

13. Input Device (1) as claimed in claim 11 or 12 **characterized by**

the insert cards (9) being magnetic, mechanical, electronic, or optical data carriers and the input device being capable of communicating with the appropriate insert card (9).

14. Input Device (1) as claimed in one of claims 8 – 13, **characterized by**

the input device (1) and/or the input area (6) having a muffle for the detection of the position of the input area (6) on a surface (30), with the varying positions of the input area (6) on the surface (30), defining the varying operation levels (23a,...2e)

15. Input device (1) as claimed in one of claims 8 – 14, **characterized by**

the activation or deactivation of individual operation areas (7, ...7f) of the input area (6), according to the selected or detected operation level (23a,... 23e).

16. Input Device (1) as claimed in one of claims 8 – 15, **characterized by**

the added usability of individual operation levels (7, ...7f) of input area (6) for the display of process parameters (14, 16) and/or process conditions.

17. Use of an input device (1) as claimed in one of claims 8 – 16, or a procedure as claimed in one of claims 1 – 7 for programming the heat controller of a heating system.

18. Use of an input device (1) as claimed in one of claims 8 – 16 or a procedure as claimed in one of claims 1 - 7 for programming a thermostat for the adjustment of the room-temperature of a room heated by a heating system and/or cooled by an air conditioning system.

19. Use of an input device (1) as claimed in one of claims 8 – 16 or a procedure as claimed in one of claims 1 – 7 for programming a heat controller for either individual or all rooms of a building.

Fig. 1

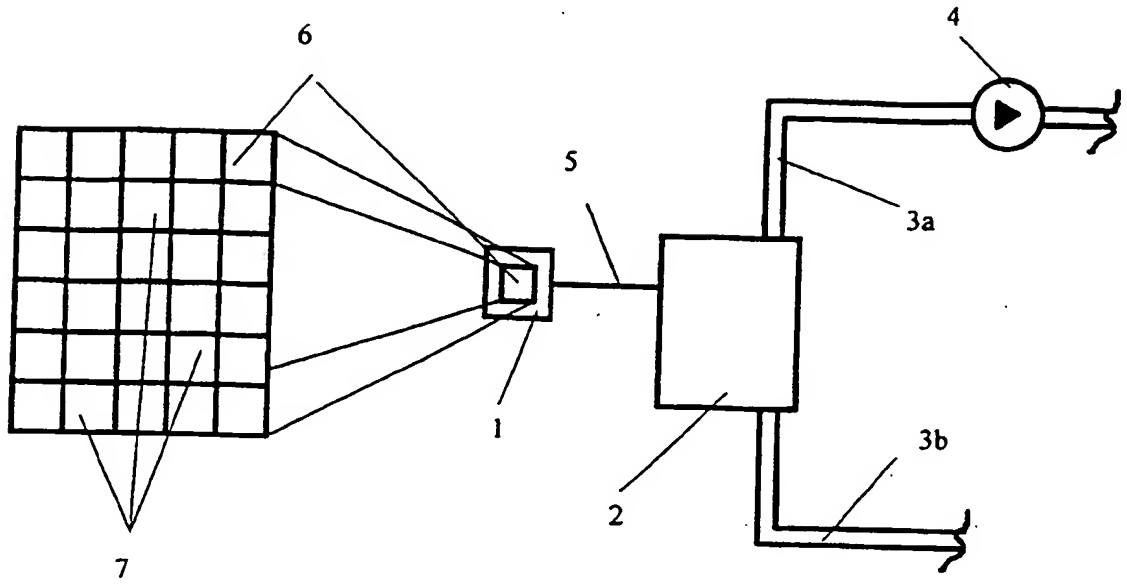


Fig. 2

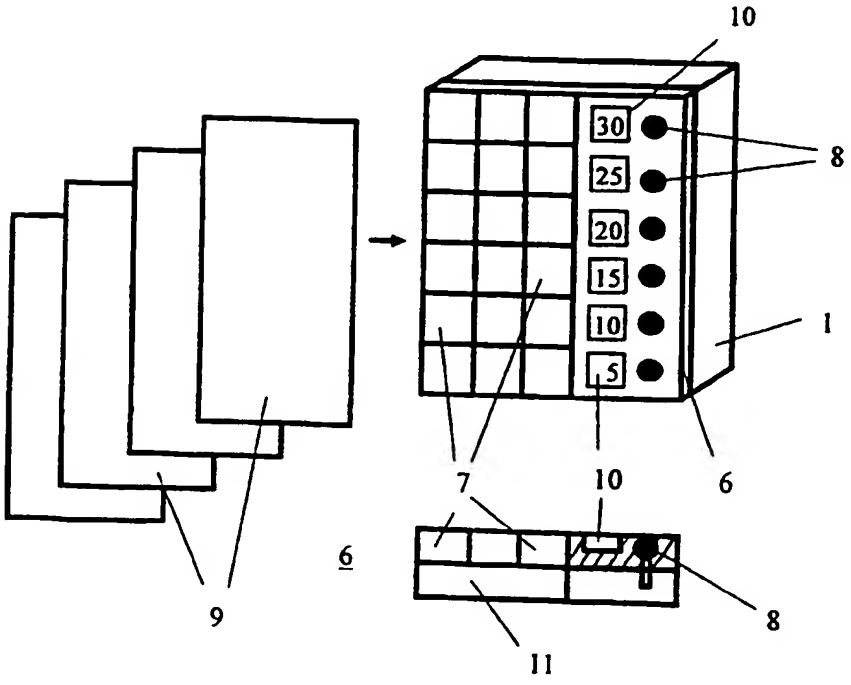


Fig. 2a

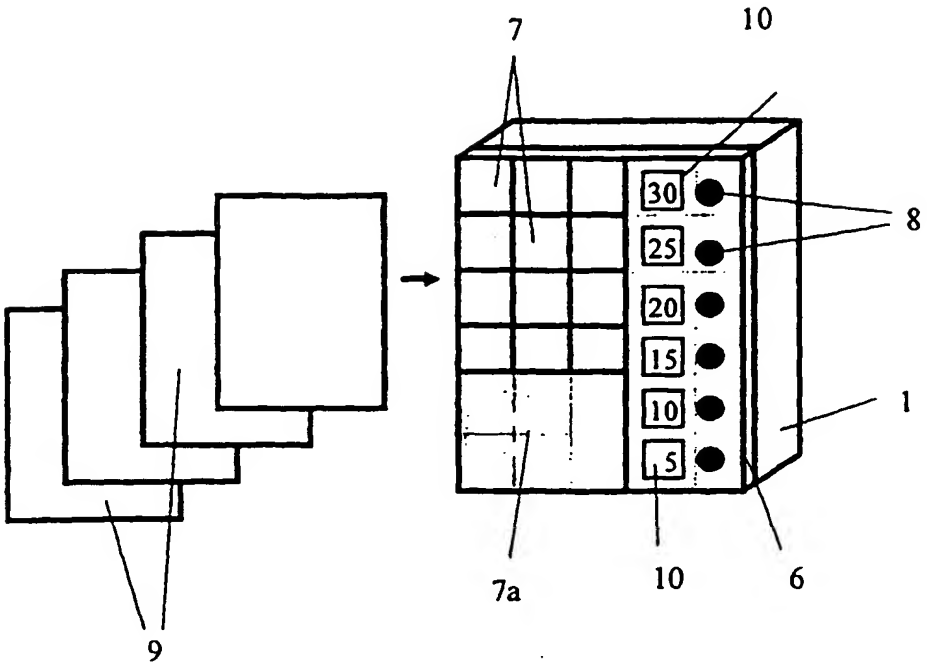


Fig. 2b

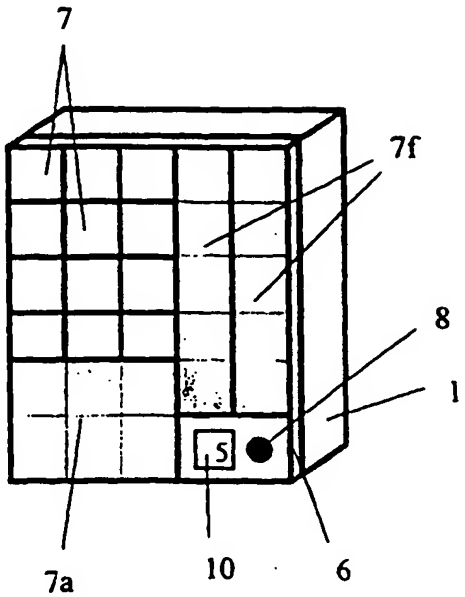


Fig. 3

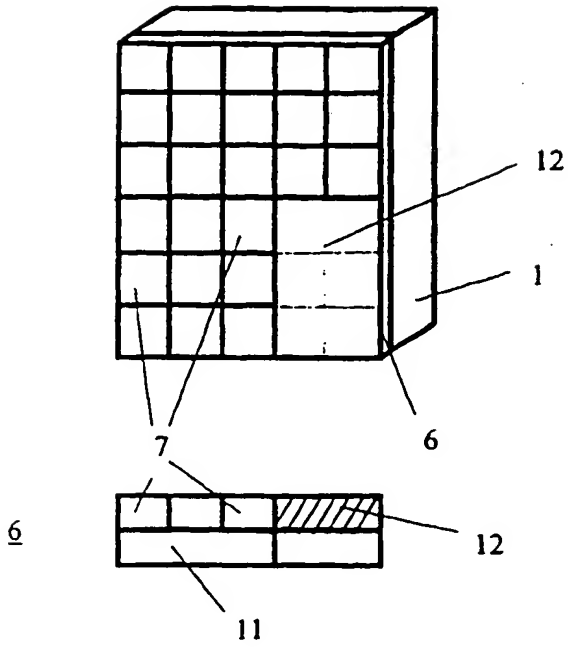
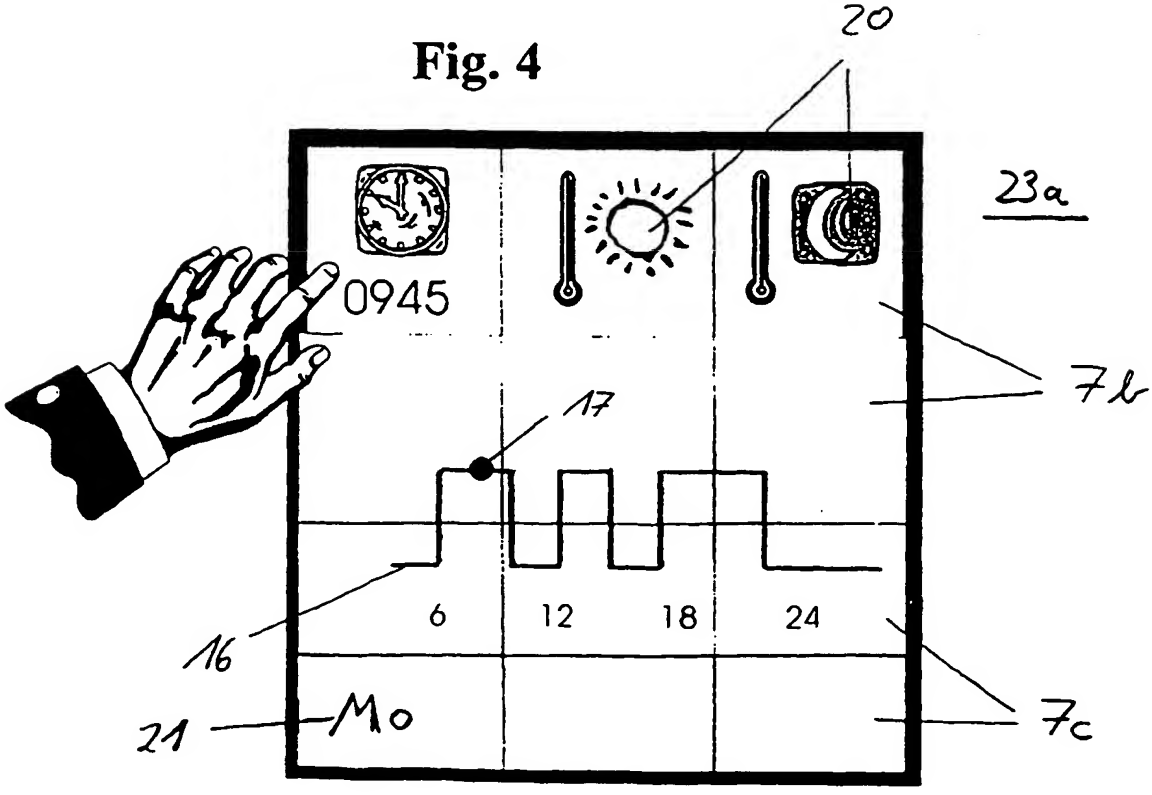


Fig. 4



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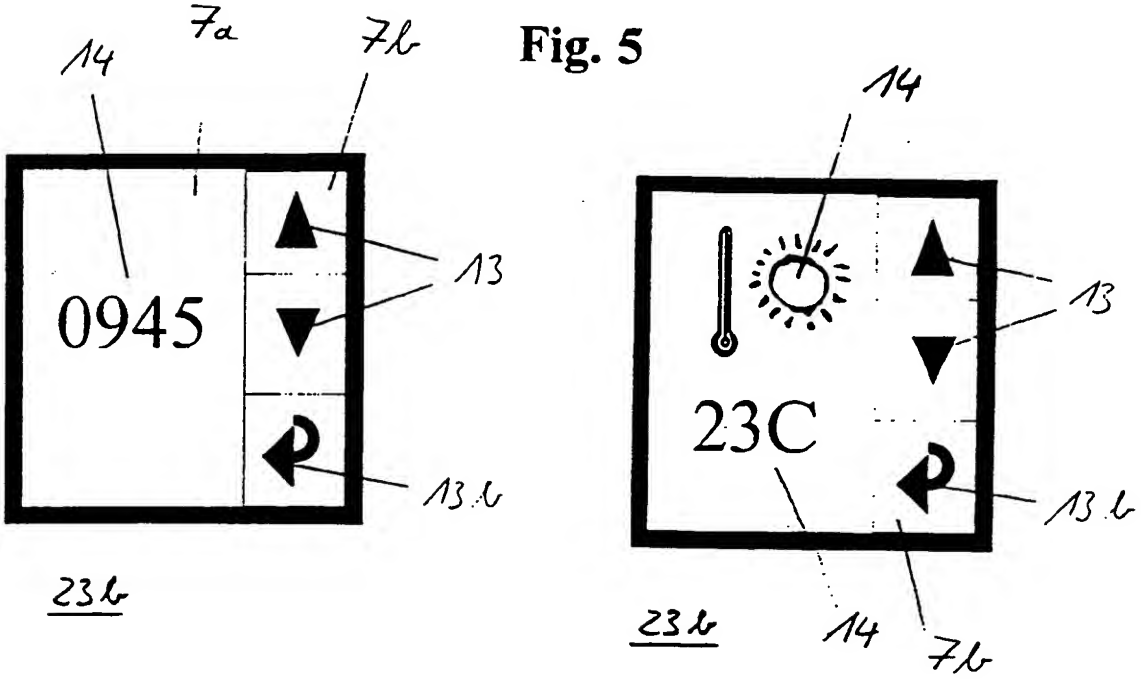

Fig. 5

Fig. 6a

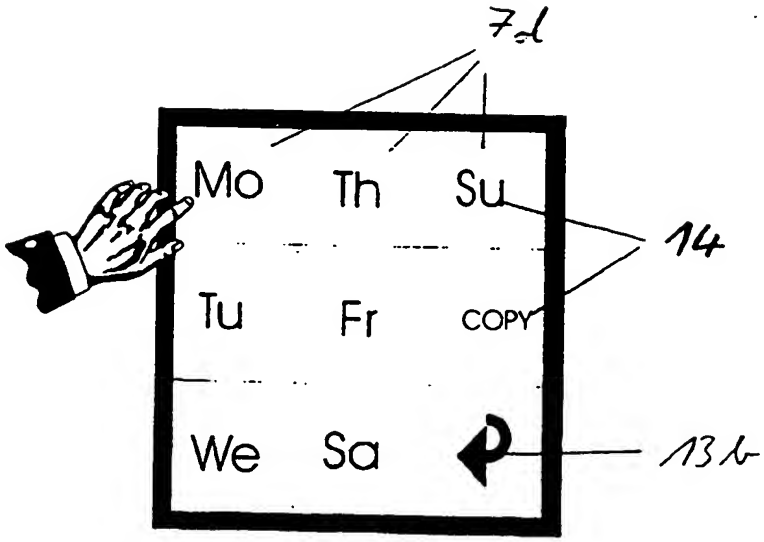

Fig. 6b

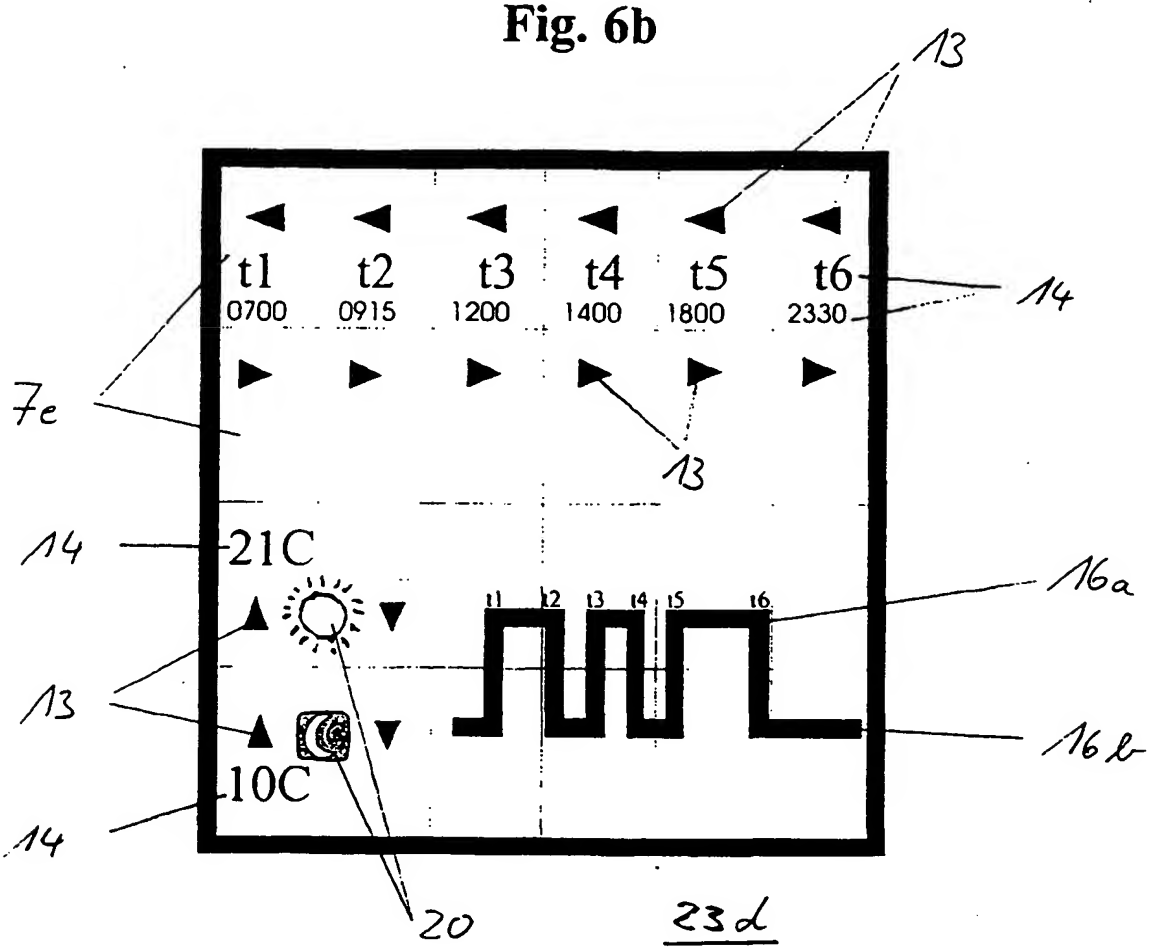

Fig. 6c

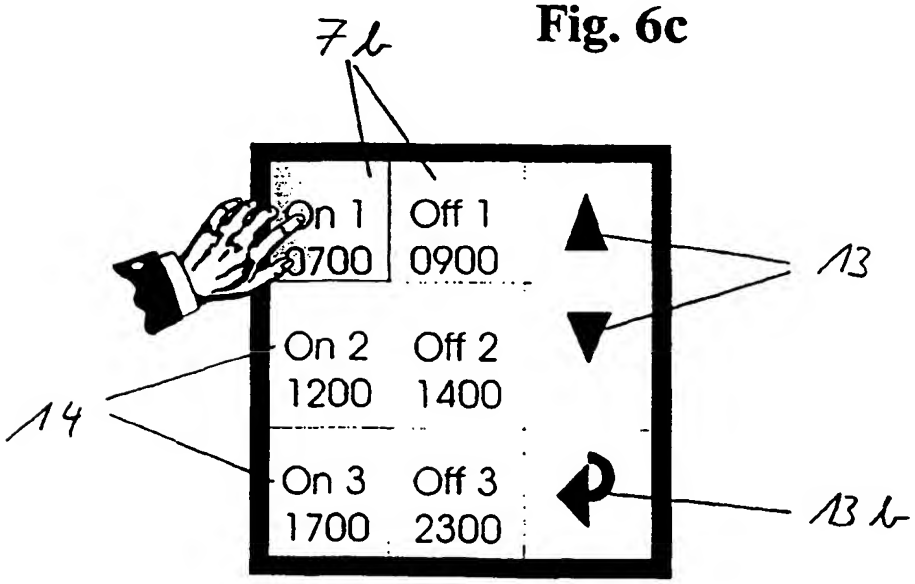

Fig. 7

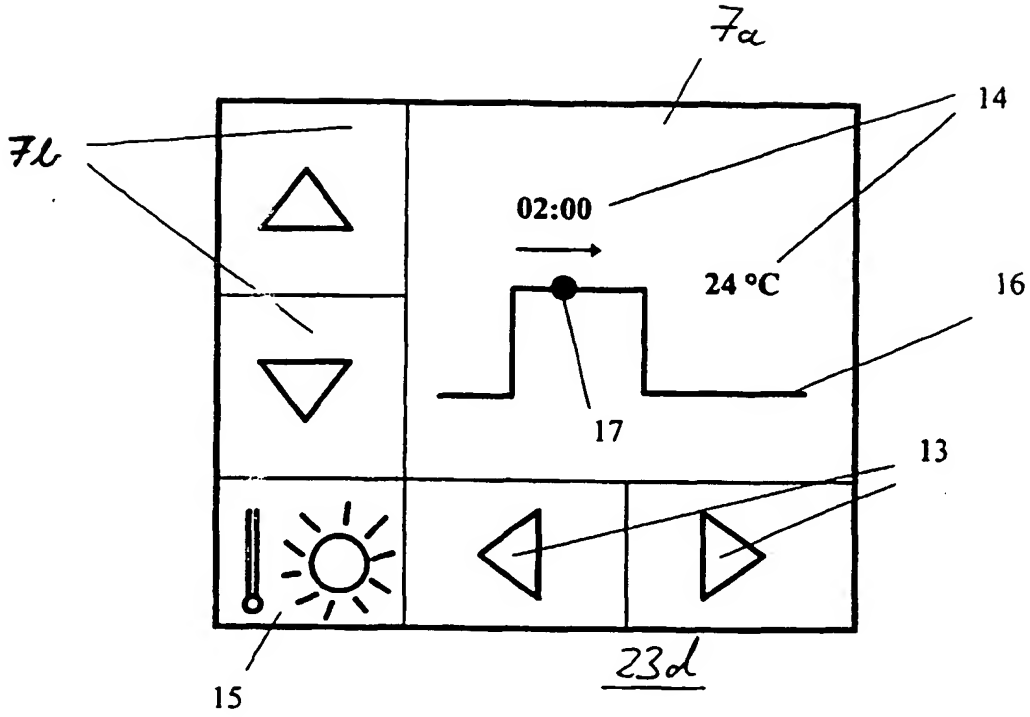

Fig. 8

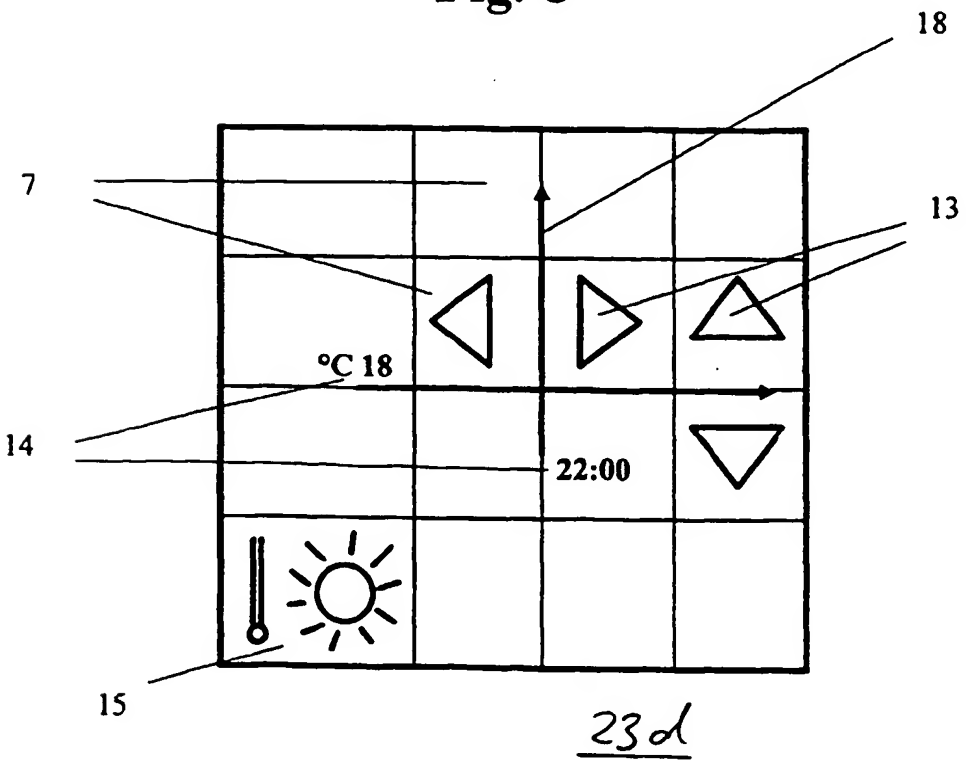

Fig. 9

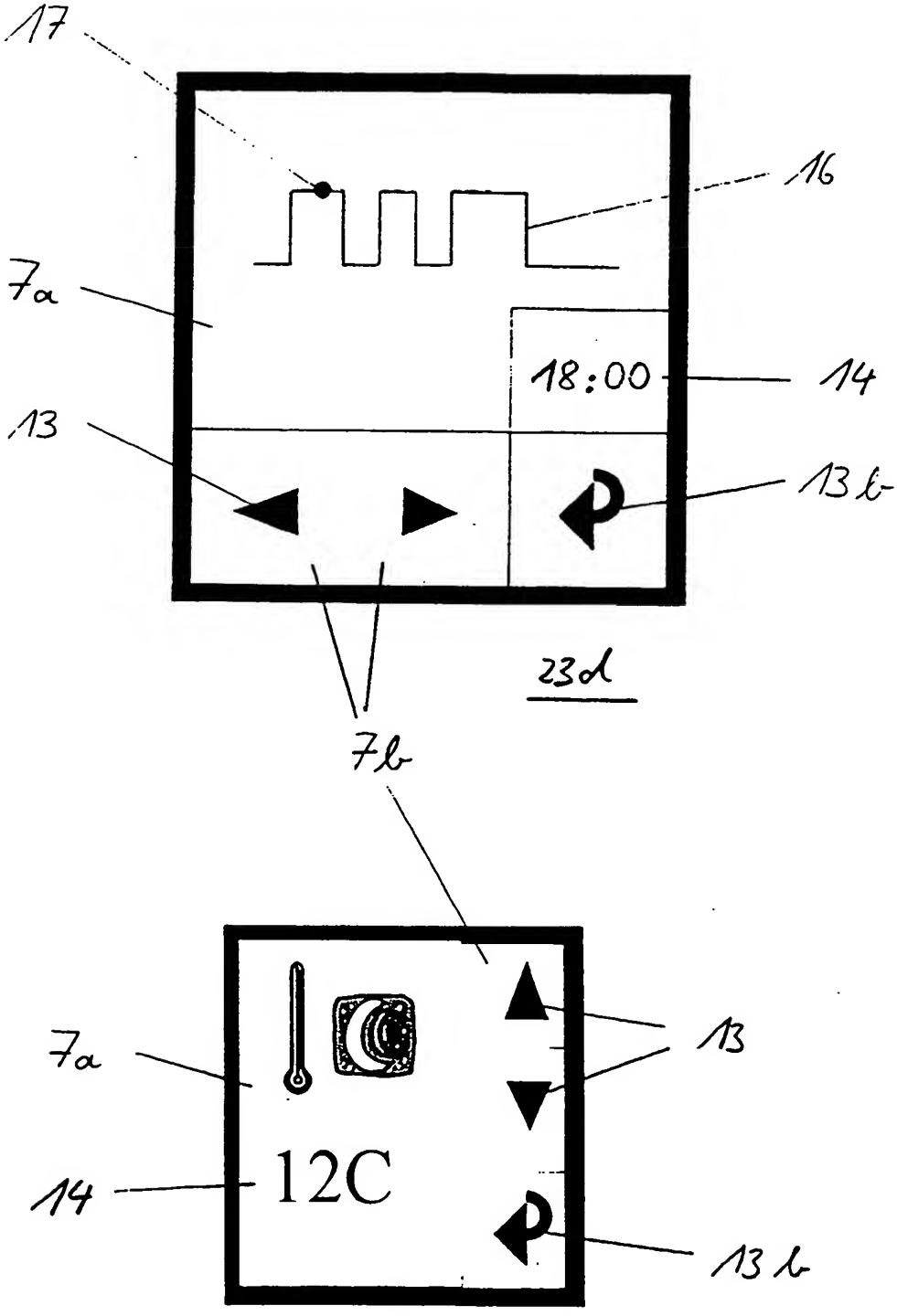

Fig. 10